

IN THE DRAWINGS:

The attached sheet of drawings includes changes to Fig. 2. This sheet, which includes Fig. 2, replaces the original sheet including Fig. 2. In Fig. 2, previously omitted elements 29-31 have been added and the location of reference numeral 26 has been amended.

Attachment: **Replacement Sheet**
 Annotated Sheet Showing Changes

REMARKS

This is intended as a full and complete response to the Office Action dated July 18, 2005, having a shortened statutory period for response extended one month to and including November 18, 2005. Please reconsider the claims pending in the application for reasons discussed below.

In the specification, the paragraphs [0021] and [0022] have been amended to add previously omitted reference numerals. Applicants submit that the changes made herein do not introduce new matter.

The drawings are objected to. The Examiner has indicated that for the purpose of examination, the inner portion of reference numeral 26 as labeled is presumed to be a solid waveguide and the convex magnet pole 25 is presumed as a solid member. The Examiner has also asserted that the area of Figure 2 between convex magnet pole 25 and solenoid coil 28 is not labeled or described in the specification.

Applicants have amended Figure 2 to show that the waveguide 26 includes a waveguide main body and a thin film on its outer surface, as described in paragraph [0021] of the specification. Applicants have amended Figure 2 to show that the waveguide 26 and the convex magnet pole 25 are solid. Applicants have added reference numeral 29 to label the area between convex magnet pole 25 and solenoid coil 28, as described in paragraph [0022] of the specification. Applicants submit that the changes made herein do not introduce new matter. Withdrawal of the objection to the drawings is respectfully requested.

Claims 1-3 remain pending in the application. Claims 1-2 are rejected. Claim 3 is withdrawn from consideration. Claims 1-3 are subject to restriction and/or election requirement. Reconsideration of the rejected claims is requested for reasons presented below.

Restriction to one of the following inventions is required under 35 U.S.C. § 121:

- I. Claims 1 and 2 drawn to a waveguide, classified in class 372, subclass 64.
- II. Claim 3 drawn to an ion source, classified in class 315, subclass 111.81.

Applicants confirm election of group I, claims 1 and 2. Applicants have canceled claim 3. Applicants have added new claims 4-10. Applicants submit that the changes made herein do not introduce new matter. Applicants submit that new claims 4-10 belong to group I, as they are also drawn to a waveguide. Applicants respectfully request consideration of new claims 4-10.

Claim 1 is rejected under 35 USC § 103(a) as being unpatentable over *Inouchi* (U.S. Patent No. 6,184,624) in view of *Jansen* (U.S. Publication No. 2005/0063659). The Examiner states that *Inouchi* describes an ion source apparatus (Figure 1) that uses a waveguide body 2 made of alumina (column 5, lines 35-45) but does not describe a titanium nitride coating on the waveguide. The Examiner states that *Jansen* describes an apparatus that uses a titanium nitride coating on a waveguide (claims 5, 6, and paragraphs [0006], [0089], and [0093]) and asserts that it would have been obvious to use the titanium nitride film on a waveguide as taught by *Jansen* in the apparatus of *Inouchi* to reduce signal propagation delays. Applicants respectfully traverse the rejection.

Jansen describes a waveguide that includes at least one evanescent region and at least one gain region, wherein the at least one evanescent region includes at least two different thin films having different indices of refraction (claims 1-4). Claims 5 and 6 of *Jansen* provide almost 70 materials, including aluminum oxide and titanium nitride, for each of the two different films. Claims 5 and 6 provide the only reference to titanium nitride in *Jansen*. Applicants respectfully submit that *Jansen* does not teach or suggest using a titanium nitride coating on a waveguide to reduce signal propagation delays as asserted by the Examiner. Instead, *Jansen* describes using a waveguide that includes at least one evanescent region and at least one gain region to reduce signal propagation delay (abstract). Applicants further submit that the presence of both titanium nitride and aluminum oxide on *Jansen's* lengthy lists of possible materials that may be used as different thin films for an evanescent region in a waveguide does not provide a teaching or suggestion of using a titanium nitride coating on a waveguide main body of aluminum oxide.

Thus, Applicants submit that *Inouchi* in view of *Jansen* does not teach, show, or suggest a waveguide comprising a waveguide main body made of a material selected

from the group consisting of a boron nitride and an aluminum oxide, and a thin film made of a titanium nitride covering an outer peripheral surface of the waveguide main body, as recited in claim 1. Applicants respectfully request withdrawal of the rejection of claim 1.

Claim 2 is rejected under 35 USC § 103(a) as being unpatentable over *Inouchi* in view of *Jansen* and further in view of *Sepp, et al.* (U.S. Patent No. 4,446,558). The Examiner states that *Sepp, et al.* teaches an apparatus that uses a waveguide main body made of boron nitride to assure highly efficient dissipation (abstract, column 1, lines 48-52 and column 2, lines 50-55). The Examiner concludes that it would have been obvious to use a waveguide main body of boron nitride as taught by *Sepp, et al.* in the waveguide as taught by *Inouchi* in view of *Jansen*. Applicants respectfully traverse the rejection.

As discussed above, *Inouchi* in view of *Jansen* does not teach or suggest a titanium nitride covering on a waveguide main body made of a boron nitride or an aluminum oxide. *Sepp, et al.* describes a waveguide that includes body portions 11a and 11b made of boron nitride (Figure 2, column 2, lines 50-55). The Examiner cites the abstract, column 1, lines 48-52, and column 2, lines 50-55 to support his assertion that *Sepp, et al.* uses a waveguide body made of boron nitride to assure highly efficient dissipation. Applicants note that column 1, lines 48-52 simply state that it is an object of the invention to assure highly efficient heat dissipation or heat transfer between heat generating components and heat discharging components of a wave guide laser structure. The abstract teaches that a spring presses the boron nitride bodies against an inner surface of the waveguide housing for good heat transfer and dissipation. Applicants respectfully submit that neither the portions of *Sepp, et al.* cited by the Examiner nor the rest of *Sepp, et al.* teaches or suggests that the boron nitride material of the waveguide body provides highly efficient dissipation. Applicants further submit that *Sepp, et al.* does not motivate or suggest using a coating on the waveguide body as *Sepp, et al.* indicates that it is desirable for the waveguide body to be in intimate contact with the inner surface of the housing 10 (column 2, lines 64-67). Applicants respectfully submit that *Inouchi*, *Jansen*, and *Sepp, et al.*, individually or in combination,

do not teach or suggest a titanium nitride covering on a waveguide body made of a boron nitride.

Thus, *Inouchi* in view of *Jansen* and further in view of *Sepp, et al.* does not teach, show, or suggest a waveguide comprising a waveguide main body made of a boron nitride, and a thin film made of a titanium nitride covering an outer peripheral surface of the waveguide main body, as recited in claim 2. Applicants respectfully request withdrawal of the rejection of claim 2.

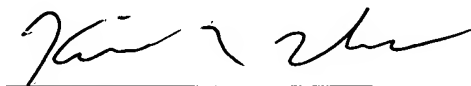
Applicants submit that new claims 4-10 are patentable for the reasons discussed above with respect to claim 1, upon which they depend. Applicants respectfully request allowance of new claims 4-10.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the office action. Therefore, Applicants believe that a detailed discussion of the secondary references is not necessary for a full and complete response to this office action.

Having addressed all issues set out in the office action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



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ATTY DKT. NO.:
U.S. SERIAL NO.:
FILED:
APPLICANT:
TITLE:
INVENTOR:

ANNOTATED SHEET
APPM/007765/IMPLANT/CONDUCTIVE/AG
10/698,673
OCTOBER 31, 2003
APPLIED MATERIALS, INC.
WAVEGUIDE AND MICROWAVE ION SOURCE EQUIPPED WITH THE
WAVEGUIDE
ITO, ET AL.

CONFIRMATION: 1025

FIGURE 2

2/2

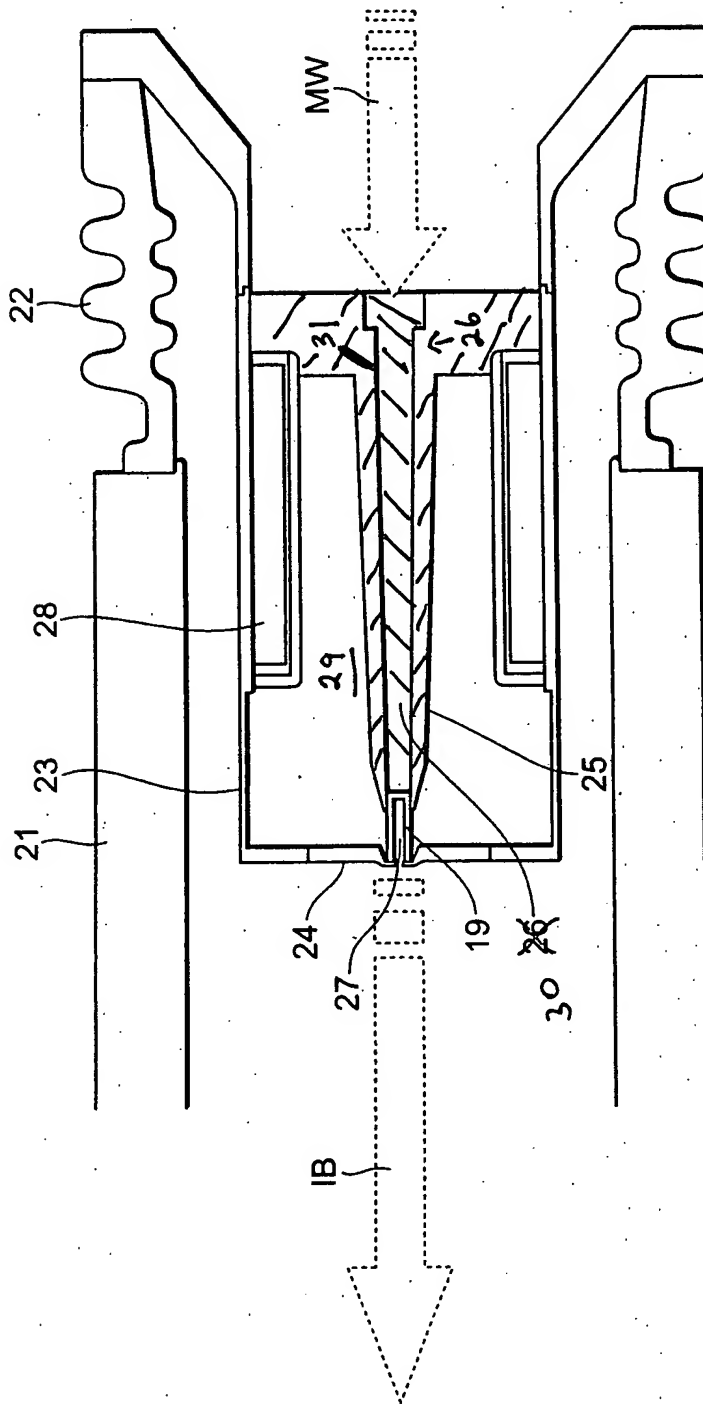


Fig.2

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